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A NEW TREATISE ON THE ART OF Grafting *and* Inoculation.

WHEREIN

The different Methods are copiouſly conſidered;

The moſt Succeſsful pointed out;

AND

Every Thing relative to theſe ancient, healthful, and agreeable Amuſements, exhibited in ſo clear and comprehenſive a Manner, as will enable thoſe who are perfectly unacquainted with this Department of GARDENING, to become Maſters of it in a very ſhort Time.

To which are added,

DIRECTIONS for chuſing the beſt STOCKS FOR THAT PURPOSE.

And many Curious

EXPERIMENTS lately made by the AUTHOR.

Calculated, in a peculiar Manner,

For the Uſe and Advantage of the GARDENER, as well as for thoſe who would wiſh to make this rural and pleaſing Exerciſe, a Part of their Amuſement.

By an EXPERIENCED PRACTITIONER
In this Branch of GARDENING.

THE SECOND EDITION.

LONDON:
Printed for STANLEY CROWDER, Bookſeller, No. 12, Paternoſter-row;
And B. C. COLLINS, in Saliſbury.

[PRICE ONE SHILLING.]

~~1796~~ 1785?

(First edit. 1780)

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PREFACE.

THE following diſcourſe, in which I have endeavoured to be as conciſe and perſpicuous as poſſible, will, undoubtedly, be found ſerviceable to every one who would wiſh to gain ſome proficiency in thoſe very uſeful and pleaſing branches of gardening, viz. *Grafting* and *Inoculation*. The whole here offered to the public, is the reſult of reiterated trials, accumulated experience, and a long and unwearied application to this kind of amuſement, which has engaged the attention of the author for many years paſt, and enabled him to produce ſomething new on the ſubject, worthy the acceptance of the public. And inconteſtable it is, that conſtant practice, and indefatigable and unremitted attention to any particular art, is infinitely preferable to ſpeculation, vague thoughts, and crude indigeſted conceptions, which too often are intruded on the public, under the maſk of true and genuine experience.

To render this work ſtill more perfect, particular directions are given how to raiſe the various ſorts of ſtocks, which are generally made uſe of for grafting on, &c. To which are added, all the improvements which have lately appeared in this department of gardening, together with the author's own obſervations and experiments. The philoſophical parts, in the ſequel, or the improvements, &c. ſuggeſted to the learned reader, which might, as there obſerved, upon accurate and long experience, be made in theſe uſeful arts, are independent, as it were, from the reſt of the work, and do not interrupt the thread of the diſcourſe, ſo that the ignorant, or leſs learned reader, will find no inconvenience nor embarraſſment from theſe additional obſervations, as he has the liberty, if he pleaſes, to paſs over that part. In the reſt of the work, great care has been taken to render it as intelligible as poſſible to the meaneſt capacity, ſo that its uſefulneſs might extend to readers of every denomination; and particularly to gardeners, and others who are engaged in the pleaſing arts of *grafting* and *inoculating*, *breeding ſtocks*, &c. &c. Theſe, I ſay, to whoſe uſe and benefit this Treatiſe is appropriated, and to whoſe province it is peculiarly adapted, will find it an intereſting and profitable companion. The Author, however, (like the majority of writers) is not ſo arrogant, or vainly ambitious, as to preſume to aſſert that it is complete, or without faults;—no,—errors are inſeparable from man, and every one knows that a perfect piece has never yet appeared, nor never will: conſonant to this is the language of the Poet,

> Whoever thinks a faultleſs piece to ſee,
> Thinks what ne'er was, nor is, nor e'er ſhall be.

It is hoped, therefore, if any failings and inaccuracies do appear to the learned reader, they will with candour be overlooked: faults there are, no doubt, as human nature is imperfect, and incapable of aſpiring to the pinnacle of perfection in any thing here below. As to the carping of the curious and cenſorious critic, who, for want of a juſt and unbiaſſed underſtanding, is proud of diſcovering miſtakes, where in reality there are none, and overlooking them, perhaps, where they really are, I ſhall ſay only, that they and their remarks are below my notice; and ſuch Zoilus's as theſe, who blame every thing others do, and do nothing themſelves, ought to be called the enemies of literature, and be branded by every man. But I have already exceeded the bounds of a preface, and ſhall only add, that I am content to confide barely on the merit of the performance, and ſhall think myſelf ſufficiently recompenced for my trouble, if it anſwers the end for which it was deſigned.

Note,—If this little work meets with a kind reception, it will in future engage the Author farther in the ſervice of the public.

Market-Lavington, Wilts,
Feb. 1, 1780.

New Method of inoculating or budding Trees.

The common Method of budding is by making a transverse Section in the Bark of the Stock, and a perpendicular Slit below it: the Bud is then pushed down to give it the Position wch it is to have. This Method is however not always succeſsful: it is better to reverse it, by making the vertical Slit above the transverse Section, & pushing the Bud upwards into its Position — a method wch rarely fails of Succeſs: because as the Sap descends by the Bark as has been ascertained, and does not ascend, the Bud thus placed above the transverse Section, receives Abundance, but when placed below, the Sap cannot reach it.

ERRATA.

Page 15, Line 14, read *ablactation*
26, 12, read *at* a proper ſeaſon
39, 21, read peach ſtones
42, 6, read *or* contracted
43, 2, read earth

***Propagating Fruit-Trees by Grafting*.**—The best luting wherewith to cover the newly grafted scions, is composed of equal quantities of train oil and rosin, thus prepared:—First, melt the rosin in an earthen vessel, then pour in the oil; mix them well; to be applied when cold, with a painter's brush. This composition never cracks, nor admits rain or wind to the grafts, which is the usual cause of their failing.

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A TREATISE

On the ART of

Grafting *and* Inoculation.

GRAFTING is an artificial method of tranſplanting a ſhoot of *one tree* into *another*, in ſuch a manner, that both may unite and form *one tree*.

THIS art is pretty ancient, and probably was diſcovered in the firſt ages of the world by ſome of the Antideluvians; perhaps by *Noah* himſelf, the firſt inhabitant, who was placed in the terreſtrial paradiſe, in order to cultivate it, and enjoy its firſt fruits. Gardening in thoſe days was highly eſteemed, and reckoned an *honourable employment*; it was even the ſtudy and delight of princes. *Nihil homini libero dignius*, nothing more becoming a gentleman, was the ſaying of the Roman Orator. Books of huſbandry were written by men whoſe exalted ſtation ſufficiently indicates the high value then ſet upon the art they taught. For the truth of this, the *Fabii*, the *Cato*'s, the *Varro*'s, the *Virgil*'s, the *Pliny*'s, and other great names, are ſufficient witneſſes.

There is indeed ſomething truly magnificent in this kind of amuſement, as it fills the earth with a variety of beautiful ſcenes, and has ſomething in it like *creation*. Whenever therefore we can breathe in freedom a few moments, we are ſenſible of an innate propenſity to gardening, among which amuſements *grafting*, and *inoculation* in particular, are as *pleaſing* and *profitable* as any thing belonging to it. It is alſo leſs laborious and fatiguing than moſt other of theſe rural avocations.—

And nothing I think can be more innocent and delightful to the mind, than to mark the gradual proceſs of germination in the tender cion, when it begins to thrive, and draw its nouriſhment from the mother ſtock. But it is infinitely more pleaſing when we ſee it ſpread, bear fruit, and become a perfect tree; when we reap the advantages of our labour, and can walk in the groves of *Pomona*, and even under thoſe ſhades which our *own induſtry* has raiſed.

Amusements of this nature compoſe the ſpirits, fill the mind with calmneſs and tranquillity, lay all its turbulent paſſions to reſt, and conduct us to every ſocial virtue; beſides that they naturally engender good thoughts, and diſpoſe us to laudable contemplations. Many of the old Philoſophers paſſed away the greateſt part of their lives among their *gardens*. *Epicurus* himſelf could not think ſenſual pleaſure attainable in any other ſcene. Gardening has had, (as before obſerved) in all ages, and all parts of the world, ſome of the greateſt Princes, the wiſeſt Philoſophers, the chief Politicians, and braveſt Warriors, as well as the moſt humble vulgar, for its admirers. Every reader, who is acquainted with *Homer*, *Virgil*, and *Horace*, the greateſt geniuſſes of all antiquity, knows very well with how much rapture they have ſpoken on this ſubject, and that the two former have each of them left us a particular *picture* of a garden, wherein thoſe great maſters have given a full idea of what they eſteemed the moſt excellent in the art of gardening. *Virgil* has alſo written a whole book on the art of planting. He deſcribes in his writings the ſerenity of ſuch employments, and highly extols the ſalutary exerciſes, and the unparalleled pleaſures of a rural life, which certainly cannot be too much commended: Indeed I cannot but think the very complacency and ſatisfaction which a man takes in theſe works of nature, to be a *laudable* if not a *virtuous* habit of mind.

The man who is fond of grafting and inoculation, and other rural employments, generally enjoys *ſound health,* and an uninterrupted *tranquillity* of mind. We may ſay a man in ſuch a ſituation taſtes in perfection the pleaſures of liſe. And are ſuch the advantages of theſe amuſements? ſurely then they cannot be too ſtrongly recommended. The perſon who can with delight ſpend his time in ſuch innocent and healthful avocations, muſt certainly be happy, if he will; for, as the Poet ſaith,

Oh happy, if he knew his happy ſtate,
The ſwain, who, free from bus'neſs of debate,
Receives his eaſy food from Nature's hand,
And juſt returns of cultivated land.
No human ſtorms break off at land his ſleep,
No loud alarms of Nature from the deep;
From all the cheats of law he lives ſecure,
Nor does th' affronts of palaces endure:
Inſtead of theſe, his calm and harmleſs life,
Free from th' alarms of fear, and ſtorms of ſtrife,
Does with ſubſtantial bleſſedneſs abound,
And the ſoft wings of peace cover him round.
Sometimes he lops the barren trees around,
And grafts new life into the fruitful wound:
And when the ſeaſon, rich as well as gay,
All her autumnal bounty does diſplay,
How is he pleas'd th' increaſing uſe to ſee,
Of his well-truſted labours bend the tree?

But enough of this; we come now to the ſubject itſelf, and ſhall firſt conſider *Grafting.*

The reaſon for *grafting* is, that as all good fruits have been accidentally obtained from ſeeds, ſo theſe when ſown will often *degenerate*, and produce ſuch fruits as are not worth cultivating; but when the ſhoots, cions, or grafts, are taken from ſuch trees as yield good fruit, theſe will never *vary* from their kind, whatever be the ſtock, or tree, on which they are grafted.

The proper ſeaſon for grafting is in the *ſpring*, juſt before the riſing of the ſap, or at leaſt before it riſes in any great quantity. The cions ſhould be cut off from the trees before the buds *begin to ſwell*, which is generally three weeks or a month before the ſeaſon for grafting. The proper time for cutting the cions of plumbs, apricots, and peaches, is about the middle of February; but medlars, cherries, pears, &c. ſhould not be cut till the latter end of that month, unleſs the ſpring ſeaſon come earlier than uſual. As for the apple, we ſeldom graft them before the beginning or middle of April; however, the ſeaſon is the *beſt rule*; for, remember, no kind of fruit trees ſhould be grafted till there is a ſufficient quantity of ſap to feed the cions, and the bark of the ſtock will ſeparate eaſily from the wood, which is ſooner or later, according to the ſtate and temperament of the ſeaſon.

THE *implements* generally made uſe of in the art of grafting are the following: A *fine ſmall hand ſaw*, to cut off the heads of large ſtocks; a *good ſtrong knife*, with a thick back, to make clefts in the ſtocks; a *ſharp penknife*, to cut the grafts; a *grafting chiſſel*, and a *ſmall mallet*, to pare away the wood; *baſs* or *woollen yarn*, to tie the grafts with; and a quantity of *clay* or *cement*, properly prepared, to lay over the inciſions, in order to prevent their bleeding, and keep out the air.

THE method of preparing the clay intended for this purpoſe, is to mix thoroughly together a quantity of ſtrong, fat loam, ſome new ſtone-horſe dung, broken into ſmall bits, a little tanner's hair or ſtraw, cut very ſmall, with a little ſalt, and as much water as will make the whole of the conſiſtence of pretty ſtiff mortar.

In the choice of grafts, the following directions ſhould be carefully obſerved: 1ſt, That they are ſhoots of the *former* year. 2dly, That they are taken from *healthy fruitful trees*. And 3dly, that you prefer thoſe grafts which are taken from the *lateral* or *horizontal* branches, to thoſe taken from the *perpendicular* ſhoots. Theſe grafts (as before obſerved) ſhould be cut off from the trees ſome weeks before the ſeaſon for grafting, that the ſtocks in the mean time may gather ſap, and the cions be more empty of it. As ſoon as they are taken from the trees, to keep them from drying, and to preſerve them from the froſt, they ſhould be laid in the ground with the cuts downwards, burying them half their length, or more, and covering the tops with dry ſtubble. If a ſmall joint of the former year's wood be cut off with the cion, it will preſerve it the better; and when it is grafted, this may be cut off; for the grafts muſt be cut to a proper length before they are inſerted into the ſtocks; but, 'till then, the ſhoots ſhould remain their *full length*, as they were taken from the tree, which will preſerve them the better from *ſtriking*.—*Note*, When the grafts are to be carried a conſiderable diſtance, it will be proper to put their cut ends into a lump of clay, and to wrap them up in moſs, which will preſerve them freſh for a month, or longer: But theſe ſhould always be cut off earlier from the trees, than thoſe that are to be grafted near the place where the trees are growing. Directions *how to chooſe* your ſtocks, &c. for grafting, will be given hereafter.

There are *divers* ways of performing the art of grafting; but the beſt and moſt ſucceſsful method that hath been diſcovered is the *following*, which is now univerſally practiſed.

The top of the ſtock is firſt cut off in a ſmooth ſtrait place, and your cion (which for a ſtandard tree ſhould be four inches long, and for a dwarf ſix) is to be ſloped off with a ſharp knife an inch or more, that it may be the better fixed to the ſtock; this done, give a cut at the top of the ſlope, ſo that there may be a kind of ſhoulder to reſt on the top of the ſtock; but care muſt be taken that it be not too deep. The whole ſlope alſo muſt be plain and ſmooth, without dints and riſings, ſo that it may fall cloſe to the ſide of the ſtock. Your cion being thus prepared, to receive the ſame, you muſt make a ſlit in the rind of the ſtock, about two inches in length, drawing your knife downwards; but be careful not to wound the ſtock. This inciſion ſhould be made on the ſouth-weſt ſide of the ſtock. At the top of the ſlit, looſen the bark with the flat haft of your penknife, clear to the wood, and with your inſtrument (which ſhould be made of ivory, ſmooth hard wood, or the like) make way for the cion, by thruſting it down between the inner bark, and the wood of the ſtock. Before you put in the cion, cut off a little of the bark at the thin end of the ſlope, that it double not in going down; however, obſerve to leave it with a ſharp end, and ſo contrive it, that it may fit well, and fall cloſe to the wood of the ſtock. Thus having exactly fitted the one to the other, bind them cloſely round with baſs mats, woollen yarn, or ſome ſuch thing, beginning at the lower part, and ſo proceeding to the top. The cement, or clay, (the uſe of which is to keep out the air) muſt then be applied, which muſt be daubed about the ſtock and cion a *compleat inch* above and below the ſtock's head. It ſhould alſo be ſmoothed with a trowel, and worked in ſuch a manner, that it may come ſharp at the top, that the rain may the better run off. If, ſome time after it is done, the clay *crack* or *cleave*, as it ſometimes does, by the froſt, or heat of the ſun, the cracks ſhould be filled up, or the grafts clayed again, for the air is *very pernicious*, and frequently deſtroys the grafts, even after they have taken the ſap, and begun to thrive.

This is called *grafting in the bark*, and it is certainly preferable to any other way. I ſhall now briefly ſpecify the other different methods mentioned by the Ancients, or practiſed at preſent by our gardeners.

Grafting in the cleft was formerly very much practiſed by the gardeners; but it is now ſeldom made uſe of, except for very large, and very ſmall ſtocks: For the latter, it is indeed preferable to the other, becauſe the bark of very young ſtocks will not eaſily ſeparate from the wood to admit the cion. Grafting in the cleft is performed in the following manner: The head of the ſtock is firſt cut off with a ſharp knife, or ſaw, as ſmooth and even as poſſible: It is then cleft with a knife or chiſſel, about two inches deep; a piece of wood cut thin at one end is to be put into the cleft, in order to open the gap, to make room for the cion, which is prepared by cutting it down a-ſlope on each ſide, about an inch in length, obſerving to leave it much thinner on that ſide which goes neareſt to the heart of the ſtock. Some cut it with a ſhoulder, as in the former caſe; but this is very immaterial. If the ſtock is pretty large, you may put in two or three cions, taking care to place them in ſuch a manner, that the paſſage of the ſap between the bark and wood of the ſtock and cion may meet all along the cleft, as near as poſſible. After the cions are properly inſerted, bind them well round with baſs matting, and clay them, as before directed.

In *whip grafting*, as it is uſually termed, the ſtock and cion ſhould be nearly of the ſame bigneſs. The cion is ſloped off a full inch or more, the ſame being done to the ſtock; after which they are joined, the one being tied upon the other. This method is improved by what we call *tipping*, or tonguing, which is to make a ſlit with a knife in the bare place of the ſtock downward, beginning towards the top of the ſlope, and ſo ſlitting it a little way, and doing the like in the ſloped part of the cion; but in the latter, obſerve to begin at the ſame diſtance from the lower end of it, as was done before from the top of the ſtock, and carry it upward. This done, join them, by thruſting the one into the other, till the cut part of the cion cover the cut part of the ſtock; bind, and properly cement it.

In *ſide grafting*, the cion is prepared as above; but inſtead of cutting off the head of the ſtock, you muſt take out from the weſt ſide thereof as much bark as the cut part of the cion will cover, ſlitting both cion and ſtock as before; afterwards it muſt be boundand clayed. The ſucceeding ſpring the top of the ſtock muſt be taken off ſloping, about *two inches* above the graft; and care muſt be taken that the head of the ſtock does not overgrow the cion the firſt year, which may be prevented by nipping the ſhoots, or cutting off part of the branches. There is another way of doing this kind of grafting; but 'tis only made uſe of when the bark will not *part* from the ſtock. The method is this: Make a horizontal cut in a ſmooth place of the ſtock, and from the middle of that cut make a ſlit downwards, about two inches in length, ſo that it may be in the form of a great T; then looſening the bark with the point of a knife, thruſt in a cion, which may be prepared as before mentioned; then bind them round, and carefully clay them.

GRAFTING by *approach*, called by the ancients *ablactation*, and by the moderns *inarching*, or *enarching*, is a method wherein the cion of one tree is united to another by degrees, and then cut off, and weaned from its mother ſtock. This way of grafting by approach is practicable only when two trees grow ſo near together that the *cion of one* may be applied, without cutting off, to the ſtock of the *other*. It is done by cutting the ſide of the branch and ſtock about three inches long, ſo contriving them, that they may ſhut well together, ſo that the paſſage of the ſap may join, in which poſition they ſhould be faſt bound and clayed. When they are well cemented, cut off the head of the ſtock, about four inches above the binding, and in March following the other part may be taken off, about an inch from the grafted place. There is *another* method of doing this, by cutting off the head of the ſtock at firſt, ſloping half off, about two inches in length, and joining the cion thereunto. This laſt method was anciently practiſed on oranges, lemons, pomegranates, vines, &c.

OBSERVE, when you graft, that the weather be *mild* and *ſeaſonable*. It ſhould be neither froſty nor wet, nor ſhould the wind blow very bleak or ſtrong when this operation is performed; for on *theſe circumſtances*, and upon the *exact joining* of the inner bark of the cion with the inner bark of the ſtock, ſo that the ſap which flows between the bark and the wood may *be communicated* from one to the other, the *ſucceſs* of grafting chiefly depends.

THE cement or compoſition which ſome have of late uſed for grafting, and which has been found to keep out the air *better* than the clay before-mentioned, is made of turpentine, bees wax, and roſin, melted together. This compoſition, when of a proper conſiſtence, is laid about a quarter of an inch thick, upon the cut part of the ſtock round the graft, and has this further advantage over the clay, that there is no danger of its being hurt by froſt; for cold hardens it; and when the heat of ſummer comes on, by which time it is no longer wanted on the tree, it will melt and fall off, without any trouble.

THE ſtocks for grafting upon ought to be *ſmooth* in the bark, *healthy*, and *ſound*. Crab is allowed to be the moſt durable, and the beſt for apples. In the nurſeries there are three ſorts of ſtocks generally uſed to graft apples upon: The firſt are called *free ſtocks*; theſe are raiſed from the kernels of all apples indifferently, and are alſo termed crab-ſtocks; for all thoſe trees that are produced from the ſeeds are called crabs, without any diſtinction; but I ſhould always prefer ſuch ſtocks as are raiſed from the kernels of crabs, where they are preſſed for verjuice; and I find ſeveral of the old writers on this ſubject of the ſame mind. Mr. *Auſtin*, who wrote an hundred years ago, ſays, the ſtocks which he accounts beſt for apple grafts is the crab, which is better than ſweeter apples, and will make fruits more ſtrong and hardy to endure froſts; and it is very certain, that by frequently grafting ſome ſorts of apples upon free ſtocks, the fruits have been rendered leſs firm and poignant, and of a ſhorter duration.

THE ſecond ſort of ſtocks is the *Dutch Creeper*; theſe are deſigned to ſtint the growth of the trees, and keep them within compaſs for dwarfs, or eſpaliers.

THE third ſort is the *Paradiſe Apple*, which is a very low ſhrub, ſo only proper for trees which are kept in pots by way of curioſity, for theſe do not continue long.

Some perſons have made uſe of codlin trees for grafting of apples, in order to ſtint their growth; but as theſe are commonly propagated by ſuckers, I would by no means adviſe the uſe of them; nor would I chooſe to raiſe the codlin trees from ſuckers, but rather graft them upon *crab ſtocks*, which will cauſe the fruit to be finer, laſt longer, and have a ſharper flavour; and theſe trees will laſt much longer ſound, and never put out ſuckers, as the codlins always do; which, if not conſtantly taken off, will weaken the trees, and cauſe them to *canker*.

The method of raiſing the ſtocks from the kernels of crabs or apples is, to procure them where they are preſſed for verjuice or cyder; and after they are cleared of the pulp, they may be ſown on a bed of light earth, covering them over about half an inch thick with the ſame light earth: Theſe may be ſown in November or December, where the ground is dry, but in wet ground it will be better to defer it till February; but then the ſeed ſhould be preſerved in dry ſand, and kept out of the reach of vermin; for if mice or rats can get to them, they will devour the ſeeds: There ſhould alſo be care taken of the ſeeds when they are ſown, to protect them from thoſe vermin, by ſetting of traps to take them, &c. In the ſpring, when the plants appear, they muſt be carefully weeded, and if the ſeaſon ſhould prove dry, it will be of great ſervice to water them two or three times a week. If they thrive well, they will be fit to tranſplant into the nurſery the October following. When they are thus tranſplanted out of the ſeed bed, the firſt autumn after ſowing, they need not be headed; but where they are inclined to ſhoot downward, the tap root muſt be ſhortened, in order to force out horizontal ſhoots. If the ground is pretty good in which the ſtocks are planted, and the weeds conſtantly cleared away, the ſtocks will make great progreſs; ſo that thoſe which are intended for dwarfs may be grafted the ſpring twelvemonth after they are planted out of the ſeed beds; but thoſe which are deſigned for ſtandards will require

quire two years more growth before they will be fit to graft; by which time they will be upwards of ſix feet high, and of a competent bigneſs.

All the ſorts of *pears* propagated in gardens are produced by budding or grafting them upon ſtocks of their *own kind*, which are commonly called *tree ſtocks*, or elſe upon the *quince* or *white thorn ſtocks*; but the laſt are now generally diſuſed, the fruit produced this way being apt to be dry and meally. The quince ſtocks are, however, in great eſteem for the trees deſigned for dwarfs, or for walls, becauſe they do not let the ſhoots grow ſo faſt and luxuriant. But there are objections againſt even theſe, which are of ſome conſequence; for there are many kinds of pears that will not proſper upon them, but will die, or become weak and good for nothing, after three or four years; and the hard baking pears are rendered very unpleaſant by being grafted on theſe ſtocks, while the buttery or melting ones are meliorated by them. And it is alſo to be minded that no ſort of pear will thrive upon a quince ſtock in a poor or gravelly ſoil.

The *medlar* is propagated by grafting it on a *pear ſtock, crab, white thorn,* or *ſervice tree.* I have ſeen it thrive extremely well on a pear, but white thorn ſtocks are now more frequently uſed. The great Dutch medlar is preferable to the common Engliſh medlar, and much better taſted. The proper time for grafting theſe is generally (unleſs the ſeaſon indicate the contrary) about the beginning of April.

Apricots of every kind are propagated by breeding them on *plum ſtocks,* and will readily take upon almoſt any ſort of plum, except the *Bruſſels,* provided the ſtock be free and thriving. Theſe ſhould be grafted pretty early in the ſeaſon, and it is rarely too ſoon at the beginning of March. The proper time, however, may eaſily be aſcertained, by obſerving when the buds begin to ſwell.

THE beſt ſtocks for grafting *peaches* on are of the *plum kind*. Thoſe of the *muſcle*, or *white pear plum*, are accounted the beſt. Theſe trees, however, and moſt of the ſtone fruit kind, are now raiſed by *budding*; for they take better by the *latter*, than by the *former* method.

STOCKS for *cherry trees* are raiſed from cherry ſtones ſet or ſowed, from ſlips, and frequently from young wild cherry trees, that are found in the woods and hedges. The beſt ſtocks, however, are thoſe of the *black*, or *wild red cherry*, which are ſtrong ſhooters, and of a longer duration than any of the garden kinds. The ſtones of theſe two ſorts ſhould be ſown in a bed of light ſandy earth, in autumn, and the young ſtocks produced from them are to remain where they are ſown till the ſecond autumn; when in October they ſhould be planted out into a rich earth, at three feet diſtance from row to row, and about ten inches diſtant in the rows. In about three years after they are planted out, they will be fit to graft, if deſigned for dwarfs;

but

but if for ſtandards, they will not be tall enough till the fourth or fifth year; for they ſhould be grafted *ſix* feet from the ground. I would rather recommend budding for the breeding of cherry trees, for grafting is ſeldom ſucceſsful.

Plums are generally grafted on inferior ſtocks of their own kind; ſometimes they will take very well, when grafted on white thorn or damſon, and they ſeldom fail on the black thorn, or ſloe tree. Some have grafted them on cherry ſtocks with ſucceſs; and this ſeaſon I myſelf made the experiment, and found it anſwer beyond my expectation; for the cion of the plum readily took the ſap of the cherry ſtock, and put forth two or three long ſhoots. At the ſame time I made other trials of the ſame kind, which ſhall be taken notice of in their proper places.

All ſuch trees as are of the ſame *genus*, i. e. which agree in their flower and fruit, will generally *take* upon each other; for inſtance, all nut-bearing trees may be ſafely grafted upon each other, as may alſo the plum-bearing trees, under which head I reckon not only the ſeveral ſorts of plums, but alſo the almond, peach, nectarine, apricot, &c. which agree exactly in their general characters, by which they are diſtinguiſhed from all other trees; but many of theſe are very ſubject to emit large quantities of gum from ſuch parts of the trees as are deeply cut and wounded, which in the tender trees of this kind, viz. peaches and nectarines, being more common and hurtful, it is found to be the ſureſt method to *bud* or inoculate them.

ALL ſuch trees as bear cones will do well upon each other, though they may differ in one being evergreen, and the other ſhedding its leaves in winter; as is obſervable in the cedar of Libanus, and the larch tree, which are found to ſucceed upon each other very well; but theſe muſt be grafted by approach, for they abound with a great quantity of reſin, which is apt to evaporate from the graft, if ſeparated from the tree before it be joined with the ſtock, whereby they are often deſtroyed, as alſo the laurel on the cherry, or the cherry on the laurel. All the maſt-bearing trees will alſo take upon each other, and thoſe which have a tender ſoft wood will do well if grafted in the common way; but thoſe of a more firm contexture, and that are ſlow growers, ſhould be grafted by *approach*.

By obſerving this rule we ſhall ſeldom miſcarry, provided the operation be rightly performed, and at a proper ſeaſon, unleſs the weather ſhould prove very bad. It is by this method that many kinds of exotic trees are not only propagated, but alſo rendered hardy enough to endure the cold of our climate in the open air; for being grafted upon ſtocks of the ſame ſort that are hardy, the grafts are rendered more capable of enduring the cold, as has been experienced of moſt of our valuable fruits now in England, which were formerly tranſplanted here from more ſoutherly climates.

THE improvements, &c. that may be made in grafting and inoculation, and the *different cions* that have been found to ſucceed when grafted on *different ſtocks*, I ſhall more particularly conſider in treating of inoculation.

Reiterated grafting, or *grafting* by a *double* or *treble inciſion*, is a method recommended by Lord BACON: It is alſo mentioned by AGRICOLA, whoſe work, though chimerical enough, contains, notwithſtanding, ſeveral very good things. To perform this, firſt graft a good cion on the ſtock, and cut it away to one half, or a third part; then fix to that remaining part of the cion another graft of a better kind, and to that a third; for the oftener the tree is grafted, the finer fruit it produceth.

BY this method AGRICOLA aſſures us, that he produced *muſcat pears* which were admirable, making at firſt uſe of a ſtock grafted with a pound pear, on which he grafted a *ſummer bon-cretien*; and when the branch of this laſt had ſhot, he grafted on it a cion of a *bergamot*, which he alſo cut, and grafted on it a cion of a muſcat pear.

To have *ſeveral kinds* of fruit upon *one* tree, the beſt way is to graft *divers ſorts* of cions upon the branches of an old ſpreading tree. Thus the cions of medlars, pears, or quinces, may be grafted with ſucceſs on an *apple tree*; as alſo apples, medlars, &c. with like ſucceſs, may be inſerted in *pear ſtocks*, *&c.* And if done with ſkill, and at the proper ſeaſon, they ſeldom fail. I have frequently grafted apples and medlars on ſeveral kinds of ſtocks, particularly *pear*, and on the contrary, the cions of pears and medlars on apple or crab ſtocks, and they took very ſure, and thrived extremely well: But it is to be obſerved, that this will not do, unleſs the trees on which they are grafted be *ſound*, *and of a good growth*. Care muſt be alſo taken that each cion be inſerted in its proper ſeaſon, i. e. as ſoon as the buds of the trees from which the cions are taken begin to ſwell, which happens ſooner or later, in different kinds of trees; but in this judgment muſt direct. The beſt and moſt ſucceſsful way for this kind of grafting is in the bark.

Root grafting is a modern invention, the deſign of which is ſomewhat different from that of any of the former methods: this being for the propagation or multiplication of plants, already fitted to produce their fruits.

To perform this, take a graft or ſprig of a young tree, which you intend to propagate, and a ſmall piece of the root of another tree of the ſame kind, or of a like genus, and whip-graft them together, obſerving that the rind of the root join cloſely to that of the graft. Theſe may afterwards be planted out at pleaſure, and the piece of root will collect the nutritive juices, and feed the graft, as the ſtock does the other way.

This method of propagation is certainly *very curious*, and at the ſame time both eaſy and expeditious in the operation, roots being more plentiful than ſtocks; by this means the pieces or roots of one crab ſtock, for example, or of one apple ſtock, will ſerve for *twenty* or *thirty* apple grafts; and the like of other trees. It is alſo an excellent way for raiſing ſuch trees, which will hardly bear of being grafted in the ſtock. Add, that trees thus grafted bear ſooner, and are more eaſily dwarfed than any other way.

THE only objection againſt this method is, that the young tree grows but *ſlowly* at firſt, which is occaſioned by the ſmallneſs of the root that feeds the graft; for in all trees the head muſt follow the increaſe of the roots, from whence it has its nouriſhment.

ALL grafts, particularly young cions, are ſubject to be injured by *birds*; but that may be prevented by binding ſome ſmall buſhes about the tops of the ſtocks. The binding of grafts ſhould be looſened when the cions have puſhed forth about an inch and a half, or two inches; for if it is continued longer, its too great tightneſs will hinder the ſwelling of the ſtock, ſo as to hazard the cion being broke by the winds at the place of the bandage; as a ſubſtitute in this caſe, if the cion is ſo ordered in cutting, that an *eye* be left againſt the place of *junction*, between the ſtock and graft, there is a probability of the buds putting forth after the damage has ſo happened, provided it is broke off above it, and thereby a year is gained.

Ablactation, or *Grafting by approach*, is not ſo much in vogue as formerly. It was a method univerſally practiſed by the ancients on orange trees, jaſmines, &c. but as we have now better ways to manage them, either by cuttings or inoculation, we ſeldom make uſe of it, except for thoſe ſorts of plants which are of a *firm contexture*, and *ſlow growth*, which will not take otherwiſe.

For ſuch, the beſt way of performing it is thus: The branch to be inarched is fitted to that part of the ſtock; the rind and part of the wood of one ſide of that branch is then pared away very ſmooth and even, for the length of three inches; and afterwards the other branch, which is to ſerve for the ſtock to which the graft is to be united, is ſerved in the ſame manner, ſo that the two may join cloſe and equally together, that the ſap veſſels may meet. A little tongue is then cut upwards in the graft, and a ſlit is made in the ſtock to receive it, ſo that when they are joined together, the tongue prevents their ſlipping, and the graft is more cloſely united to the ſtock. When they are thus placed exactly together, they muſt be tied with baſs, worſted, or ſome other ſoft ſtuff, and the place of junction muſt be well covered over with grafting clay, to prevent the air from drying the wound, and the wet from rotting the ſtock. A ſtake muſt alſo be fixed in the ground, and both the ſtock and graft muſt be tied thereto, to prevent their being diſplaced by the winds. When they have remained in this ſtate four months, they will be ſufficiently united, and the graft may then be cut off from the mother tree, obſerving to ſlope it *cloſe* to the ſtock. It is of great ſervice to the graft then to lay a freſh coat of clay all round the graft or jointed part. This operation ſhould be performed in April or May, that the graft may be perfectly united to the ſtock before the enſuing winter. The baſs uſed for this, or for any other binding, ſhould be taken from a ſound mat, and be ſoaked in water for ſome hours to encreaſe its ſtrength, and render it more pliable.

Whip Grafting, or *Tongue Grafting*, is moſt proper for ſmall ſtocks, from an inch diameter to a quarter of an inch, or leſs. This method I would *particularly* recommend, becauſe it is generally *ſucceſsful*. Mr. *Worlidge*, Mr. *Loudon*, Mr. *Miller*, and others, ſpeak of it as the moſt ſucceſsful way of any, and that which is moſt in uſe, becauſe the cion covers the ſtock much ſooner in this method than in any other. But it muſt be obſerved, that the cion and ſtock muſt be always of the *ſame bigneſs.*

If the reader pleaſe to look back in the preceding pages, he will find I have already mentioned how it is performed; however, it may not be improper to obſerve, that ſome, inſtead of ſloping the cion and ſtock as before recited, cut off the latter as ſmooth and even as poſſible; and after having made a ſlope, and at the top of that ſlope a ſhoulder in the cion, join them cloſe together; a ligature is then made round them, with baſs or woollen yarn, and the engrafted part is well covered with clay or cement.

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Of INOCULATION, *or* BUDDING, *&c.*

THIS, as before obſerved, is uſually practiſed upon *all ſorts* of *ſtone fruit*, as nectarines, peaches, apricots, plums, cherries, &c. as alſo upon oranges and jaſmines, &c. And indeed this is *preferable* to any ſort of grafting, for *moſt* kinds of fruit.—It is uſually performed in the following manner:—You muſt be provided with a *ſharp penknife*, with a *flat haft*, which is to *raiſe* the bark of the ſtock, to admit the bud, and ſome *ſound baſs mat*, which ſhould be ſoaked in water to encreaſe its ſtrength, and render it more pliable; then having taken off the cuttings from the trees you would propagate, you muſt chooſe a *ſmooth part* of the ſtock, about *five* or *ſix* inches above the ſurface of the ground, if deſigned for dwarfs; but if for ſtandards, they ſhould be budded *ſix* feet above the ground; then with your knife make an horizontal cut acroſs the rind of the ſtock, and from the middle of that cut make a ſlit downwards, about *two* inches in length, ſo that it may be in the form of a T; but you muſt be careful not to cut too deep, leſt you wound the ſtock; then having fixed upon a leaf that hath a freſh and fair bud growing out between it and the bark, cut off the leaf from the bud, leaving the foot ſtalk remaining; this done, you muſt make a croſs cut, about half an inch above the eye, and with your knife ſlit off the bud, with part of the wood to it: You muſt alſo with your knife pull off that part of the wood which was taken with the buds, obſerving whether the *eye* of the bud be left to it or not; for all thoſe buds which *loſe* their eyes in ſtripping are good for *nothing*; then having gently raiſed the bark of the ſtock with the flat haft of your penknife clear to the wood, thruſt the bud therein, obſerving to place it *ſmooth* between the rind and wood of the ſtock, cutting off any part of the rind belonging to the bud, that may be too long for the ſlit made in the ſtock; and ſo having *exactly* fitted the bud to the ſtock, tie them *cloſely* round with baſs mats, beginning at the lower part of the ſlit, and ſo proceeding to the top, taking care not to bind round the *eye* of the bud, which muſt be left *open.*

Some gardeners, after having prepared the bud as above directed, cut out the bark *entirely*, and apply the cion to the diſbarked place. Others make a cut downward in the bark about two inches long, and another acroſs the middle of that; then gently raiſing the four corners of the bark, thruſt in the bud, taking care that it fits *cloſe* to the wood of the ſtock. Another method practiſed by ſome is, to make a cut downward as before, and another horizontal one at the bottom of that; then looſening the bark with an inſtrument provided for that purpoſe, the bud being made ſharp at one end, is thruſt gently up between the bark and the wood. All theſe different methods are made uſe of by different perſons; but the firſt method I pro-

poſed

poſed above is preferable to any other, and the moſt *ſucceſsful*, as I have found by experience.

When your buds have been inoculated three weeks or a month, thoſe which are *freſh* and *plump* you may be ſure are *joined*; and at this time you ſhould *looſen* the bandage, which if it be not done in time, will injure, if not totally deſtroy the bud. Note alſo, if you perceive the bark *ſwell* where the binding is, cut it off; and if the firſt inoculation fail, which may be known by the colour, &c. the ſtock may be inoculated again the next ſummer, or the very ſame year, provided the inoculation be done early. When your buds thrive luxuriantly, and are in danger of being *diſplaced* by winds, faſten them to the ſtocks with matting, or ſome ſuch thing. The March following, cut off the ſtock ſloping, about three inches above the bud, and to what is left faſten the ſhoot; but this muſt continue nol onger than *one year*; after which the ſtock muſt be cut off cloſe above the bud. When you inoculate, always make choice of *cloudy weather*; for if it be done in the middle of the day, when the weather is hot, the ſhoots will perſpire ſo faſt, as to leave the buds *deſtitute of moiſture.*

THE proper time for inoculating is from *Midſummer* to the *middle of Auguſt*; but the moſt general rule is, when you obſerve the buds *formed* at the extremity of the ſame year's ſhoot, which is an indication of their having finiſhed their ſpring growth. The evening of a fair day is reckoned the *propereſt* time for this buſineſs. The firſt ſort of trees commonly inoculated is the *apricot*, next the *peach*, *plum*, *cherry*, &c. and the laſt the *orange tree*, which ſhould never be done till the latter end of Auguſt. Great care muſt be taken that the buds are not *injured* in the operation.

STOCKS raiſed of peach ſtones are commonly big enough to be inoculated the *ſecond* or *third* ſummer. The buds ſhould be choſen from a *healthy* tree, which produces a great deal of fruit. And the inoculation ſhould be always done in the *morning* or *evening* of a fair day, when the ſun has not much power: Alſo, in a dry time if poſſible; and the ſtocks ſhould be treated with the uſual care afterwards. Sometimes peaches are budded on *plum ſtocks* with ſucceſs, particularly in what we call the *wheat plum,* on which ſtock they uſually take *ſure,* and thrive well. The *white pear plum* is in the ſame predicament. Peach trees ſhould be always budded within about an *handful* of the ground.

As for plums, cherries, pears, and other fruit, they may be inoculated *higher* on the ſtocks: The young trees ſhould be brought up in the nurſery, and grow there three or four years before they are removed. As for the choice of ſhoots from which you take your buds, care muſt be taken that they come from *healthy, fruitful* trees; that they be of a *ſtrong* growth, *firm* bark, and not any ways *ſpungy.*— Nectarines, peaches, and apricots, are now ſeldom raiſed otherwiſe than by inoculation: Cherries and pears take very ſure; moſt plums hit very well; but apples *fail* for the moſt part, their bark being tender, and buds weak; however, I have found the latter ſucceed very well, by taking a bud from the *former* year to inoculate with, provided the ſame be well choſen. Upon the whole, where inoculation ſucceeds well, it is (as before ſaid) to be preferred before grafting; for the ſtock for inoculation will be *much ſooner* big enough than for grafting; beſides, the tree, when the nature is ſo changed, will thrive much better than it did before, and will be ſooner ready to tranſplant; neither will the ſtock be ſo *much hurt* as in grafting; and if it chance to fail, it may be inoculated again the next year, or perhaps the very ſame ſeaſon, if done timely. The operation is alſo much more decent, ſpeedy, eaſy, and delightful, than grafting.

The inſertion or inoculation of a cion or bud into the bole of a ſtock, for the improvement and propagation of fruit trees, ſeems to be nothing more than an *artificial tranſplanting* of thoſe trees, juſt the ſame as though they were put into ſuitable earth; by putting their ſeeds into a good proper ſoil, whereby the ſeminal principles concentred in the ſeed, ~~[illegible]~~ or contracted into thoſe prolific buds, are put into their proper matrix, which, with other requiſites concurring, are ſet into their vegetative ſpring, or fermental motion. And 'tis apparent that the *fitneſs* of ſtocks anſwers the *peculiarity* of ſoils. For *all ſorts* of cions or buds are not proper, or with expected ſucceſs, to be grafted or inoculated in *any ſort* of ſtock, no more than any kind of ſoil is naturally fitted and qualified for every kind of ſeed. There is, indeed, this difference, that in the one (viz. in the earth) the juice prepared lies more *crude* and ſcattered, whereas in the other (viz. in the ſtocks) it is *digeſted* and *naturalized*, as it were, if I may be allowed the expreſſion.

'Tis plain that the bole of any tree is as a *peculiar ſoil* to the proper engrafted or inoculated cion or bud; becauſe if a ſufficient quantity of earth be caſt about the tree, (after it has begun to thrive, and put forth branches) above the place where it was grafted or inoculated, the cion or bud will ſhoot out *fibrous roots* juſt as if it (or the ſeed) was *originally* planted into any well prepared ſoil; hence 'tis evident that the root and bole of the tree do nothing more than prepare a *liquor* or *juice*, proper for the nouriſhment, growth, and increaſe of any ſuitable graft or bud inſerted therein; which the aforeſaid cion imbibes and tranſmits by its own fermental principles into its own nature, admitting not of the *leaſt tincture* of the native diſpoſition, or ſeminal inclination, from the *aſſumed ſap*.

THUS, for inſtance, we commonly inoculate a fruitful bud or cion of an apricot or peach into a *plum ſtock*, whoſe thriving, budding, putting forth branches, &c. are in fact nothing more than the evident *indexes* of the action of the ſeminal principles of thoſe inoculated buds, which being ſet into motion, (by requiſites duly concurring) admit of the juice or ſap of the bole, and becomes fermental, daſhing the preconceived ſeminal tincture of the ſtock, (whereby it was diſpoſed to the putting on the form of a plum tree) tranſmutes that juice into its own nature, and ſo from the *inteſtine ſtrugglings* of the ſaid ſeminal principles of the *inoculated bud*, proceeds the vegetation and growth of the whole, clothing itſelf with all thoſe natural liveries peculiar to the texture of ſuch ſeminal prolific principles.

If you cut off the old root and bole of a tree, after the inſerted cion or bud has begun to thrive, and ſent forth roots as before mentioned, the ſaid cion or bud, if tranſplanted, will become an *entire tree* of itſelf. From the ſame cauſe it is, that you may by *ſplicing*, as the gardeners call it, propagate as many trees as you pleaſe: Alſo by layers you may raiſe almoſt as many trees as there are prolific buds, if in caſe they could be all conveniently laid; from whence it appears, as I ſaid before, that the ſap of the ſtock is to a cion or fruitful bud, the ſame as the *earth* to a *ſeed*, or as the *earth* to a *laid cion*.

HENCE, tis evident, that by grafting and inoculation, there may be *great improvements* made, as to the *acceleration*, *melioration*, and *fructication* of ſome fruit trees. Thus we ſee the bud or cion of an apricot is *haſtened* as to its fructifying, by being inſerted into *plum ſtocks*; peaches by being put into *apricot*; as alſo cherries, ſuch as the Flanders kind, hart, duke, &c. put into wild or black *cherry ſtocks*, by which means in *two* or *three* years they become *fruit-bearing trees*, which if raiſed from the ſtones, or propagated from ſuckers, would not come to paſs till after many more; and they are not only haſtened as to their growth and maturity, but are alſo bettered both as to bulk of fruit, and pleaſantneſs and gratefulneſs of taſte.

'TIS probable that, if the bud of a quince were ſkilfully inoculated into ſome *early apple ſtock*, the ſame might be haſtened as to *maturity:* Alſo *later* grapes of a more delicate taſte, artificially inoculated into *more early,* might do the ſame.—And 'tis not unlikely, if accurate trials were made of this nature, but melons, inſerted into pompions, might make them both *more early* and *more large,* eſpecially if the ſeeds of pompions were to be brought up in *hot beds,* to be ready early in the ſpring, while the others are alſo foſtered in the ſame, 'till they were fit for inſerting. Again, 'tis probable, if the prolific buds of oranges (trained up from their ſeedlings in hot beds, or other ſuitable ſoil) were inſerted in ſome ſort of trees that grow well with us, and ſeem ſomewhat to reſemble them, as for inſtance, in ſome *choice apples,* (as pippins or pearmains) or in *quinces,* we might have oranges grow frequently with us in England; for the reaſon why ſuch tender trees do not fructify with us is, the want of a *competent heat,* or the effect of our intenſe cold or froſt in the winter ſeaſon, which reaching the roots of ſuch weak trees, ſtints them, and prevents their fruit bearing, by ſuſpending the fermental action of the ſeminal principles; nay, ſometimes it ſo overpowers them, that it totally kills them.

If, therefore, inſtead of training up orange-trees from hot nurſeries, we take their prolific buds, (which we can by hot beds eaſily procure) and inſert them by inoculation into the ſtocks of the before-mentioned trees, we ſhall abſolutely *ſecure* them from *froſts*, which being removed by the aforeſaid artificial expedient, bids fair, on ſuch trial, to have plenty of oranges grow with us in England.

Thus, alſo, if the fruitful buds of *figs* (which rarely in England come to maturity for want of ſufficient heat) were inoculated into ſome kinds of *good pear*, ſuch as the *bergamots*, &c. it might probably procure their maturity. Theſe, I think, and *many other* obſervations and experiments, concerning the *maturation* and *melioration* of plants and fruits, might be made, not yet taken notice of.

WHAT improvements might alſo be made are only here propoſed to further trial, in order to the having of *roſes*, and perhaps ſome other flowers, *all the year*, by inoculating their buds ſeaſonably into ſome *evergreens*, ſuch as *yew*, *fir*, or *pine*, eſpecially if thoſe trees were aſſiſted by ſome *artificial heat*, by being planted near ſome *ſtoves* or *furnaces*, where a proper heat might be kept and conveyed to them all the winter: For the principles in any prolific bud being ſet into motion, by being planted into any proper ſtock, the juice of that ſtock at the ſame time being warmed by any adventitious heat, or what way ſoever kept in action, becomes like a *ſoil* adapted for them, whereby the aforeſaid principles become *fermental*, *vegetate*, and put on the intire form of the whole plant or tree.

THERE might, as I ſaid before, be a great many curious experiments made to advantage, by judicious perſons, in grafting and inoculation, which have never yet been tried, or ſo much as thought of.—

I have known plums frequently grafted, and ſometimes inoculated, on *cherry trees*, and it is certain, that the cions will ſometimes *take*, and thrive well; by this means alſo the fruit comes *earlier*, and is more grateful and palatable.—Cherries may alſo be grafted on *plum ſtocks*, but theſe ſeldom proſper long. Apples grafted on pear ſtocks often take *eaſily*; and pears on apple generally *ſucceed well*, as I have been convinced by experience. The cions of *pears* may alſo be inſerted on *quince* and *thorn ſtocks*, and Lord *Bacon* ſaith, that ſome have grafted apples on *elm ſtocks* with ſucceſs. It is alſo aſſerted by ſome of the ancients, that the *oak* will take the *pear*, or almoſt any other kind of fruit, by grafting; but, as Mr. *Evelyn* obſerves, this is very improbable, becauſe the ſap of the oak is *unkind* to moſt trees.

THE *medlar* may be grafted on thorn, cherry, or pear ſtocks, and ſeldom *fails* if done ſeaſonably. *Filberts* may be grafted or inoculated on *common hazel*; and the large *Spaniſh nut* ſometimes thrives pretty well on the *filbert tree* or *common hazel*. *Walnuts* are uſually propagated from their own kernels, or grafted with their *own cions*. It is ſaid, if grafted on *aſh*, they proſper well; but this is fictitious, as I have found by experiment.

Sometimes the ſeaſon is ſo very *unfavourable* to grafts in general, that the greateſt part of them are deſtroyed, and your labour is all thrown away. Exceſſive dry ſprings are hurtful. Bleak northern winds and froſts are very prejudicial, and even when the cions have begun to thrive, theſe will *ſtint* their growth, if not *entirely* deſtroy them. There is no remedy to prevent theſe evils. The beſt method, however, to ſecure them from the froſt, is, to lay on a pretty deal of cement, and to keep the clay from cracking as much as poſſible, by mixing it with a ſufficient quantity of hair, &c. When your grafts have thrived well and luxuriantly, they are in great danger of being taken off by the *wind*. To prevent this, pinch, or cut off the *tops* of thoſe ſhoots that are moſt in danger. Some make it a practice to take off the cement when they begin to ſhoot, but this ſhould never be done, for it not only expoſes them more to the power of the winds, but injures them exceedingly, by opening them to the *ſun* and *air* before the cions and ſtocks are *properly* joined.

If a *vine* be grafted on a common cherry, or any other of the kind, the grapes which it produces will be ſo *remarkably* forward as to be ripe in the ſeaſon of *cherries*. But it is very difficult to graft a vine well on a cherry ſtock, ſo as to make it thrive and flouriſh. The following method has, however, been generally ſucceſsful.

First bore a hole with an augur in the trunk of a cherry tree; in this hole inſert the cion of the vine, and let it grow there till it has filled the hole of the augur, and is cloſely joined to the cherry tree. Then cut off the vine branch from the vine, after which it will draw all its nouriſhment from the cherry tree, whoſe ſap will haſten the formation and maturity of the grapes, which will be ripe near *two months* ſooner than ordinary.

It is ſaid that the fruits of any kind of tree may be rendered more delicious by *boring a hole* in the trunk of the tree near the root, and afterward filling up the aperture with the *ſap* of the *ſame tree*, in which you have previouſly infuſed ſome ſweet and odoriferous matter.*

Lord *Bacon* ſaith, that the leaves of ſhady trees, by grafting, may be made *larger* than ordinary: And he delivers it for a certainty, that if the cion of a *witch elm* be grafted upon the ſtock of an *ordinary* elm, it will put forth leaves almoſt ſo broad as the brim of one's hat; for as in fruit trees the graft maketh a *greater* fruit, ſo in trees that bear no fruit, it will make the *greater* leaves.——*Nat. Hiſt. cent.* 5, *pa.* 100.

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* See Philoſoph. Tranſact. for February 1668.

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